

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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SERIAL NO.:

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TITLE: APPARATUS INCLUDING A SUCKER WITH AUTOSELECTION FUNCTION FOR HANDLING MATERIAL

Preliminary Amendment: CLAIM AMENDMENTS

1. (Currently amended) Apparatus for handling material, including comprising:

at least one sucker for lifting-release of the material, ~~that provides providing~~ a vacuum, obtained between said sucker and the material to be handled, generated by vacuum forming means by means of Venturi effect or by ~~means of~~ a vacuum pump; and

~~characterized in that the apparatus is made up of a multi-way pneumatic circuit of an auto-selection valve, that includes having main pneumatic commutators, said the commutators being interconnected to a third pneumatic commutator interposed between the vacuum forming means and the auto-selection valve.~~

2. (Currently amended) Apparatus for handling with suckers, The apparatus according to claim 1, ~~characterized in that it is being~~ essentially divided into blocks, to which at least one sucker is connected; wherein, respectively, a first block is ~~made up comprised~~ of a pneumatic installation for the supply of dependent blocks, the second and third, comprising an auto-selector valve that interacts with vacuum generation means, said first block being ~~essentially made up comprised~~ of pressure regulators and interacting commutator electro-valves with an alternative valve; wherein said

first block supplies a second block that includes the auto-selection valve and is substantially made up comprised of pneumatic commutators, a relief valve and vacuum generator means.

3. (Currently amended) Apparatus for handling with suckers; The apparatus according to claims 1 and 2, characterized in that the Claim 1, wherein the block that includes having the pneumatic installation supplies one or more suckers, just as the block that includes having an auto-selector valve that interacts with vacuum generation means is applied to every sucker or group of suckers.

4. (Currently amended) Apparatus for the handling with suckers; The apparatus according to previous claims, characterized in that the Claim 1, wherein said auto-selection valve includes comprises two pneumatic commutators, each provided with an axially movable and elastically yielding piston.

5. (Currently amended) Circuit for an apparatus that carries out handling with suckers; The apparatus according to previous claims, characterized in that Claim 1, wherein the circuit, in the case of activation, through an impulse the electro-valves of the first block are excited so that by means of a first electro-valve the air impulse passes through the pneumatic commutators of the second block to supply the vacuum generator; while with the second electro-valve, the airflow supplies a first pneumatic commutator, in such a way as to determine the movement of the second piston; in this case the air originating from the electro-valve, passes through the alternative valve, moves the

sphere allowing the supply of the circuit, which on entering into the second block determines the movement of said piston.

6. (Currently amended) Circuit for an apparatus that carries out handling with suckers, The apparatus according to previous claims, characterized in that Claim 1, wherein the circuit with the airflow originating from the first electro-valve of the first block, entering into the subsequent block for a few seconds, activates a depression in the circuit and therefore maintains the piston of the pneumatic commutator in auto-relief.

7. (Currently amended) Circuit for an apparatus that carries out handling with suckers, The apparatus according to previous claims, characterized in that Claim 1, wherein the circuit comprises at least one pneumatic commutator of the second block is being provided with a more rigid spring.

8. (Currently amended) Circuit for an apparatus that carries out handling with suckers, The apparatus according to previous claims, characterized in that Claim 1, wherein the circuit has the airflow introduced from a first electro-valve, passes passing first through the pneumatic commutators to the piston of the second block, then through a third pneumatic commutator provided with a more rigid spring, to supply the vacuum generator that raises the sphere of the relief valve thus supplying the circuit with a depression that simultaneously supplies the sucker for the movement of the material and the piloting of the circuit.

9. (Currently amended) Apparatus and circuit for an apparatus that carries out handling with suckers, The apparatus according to previous claims, characterized in that Claim 1, wherein the piloting depression, passing through the perforations of the shaft of the piston of the first pneumatic commutator, forms an eddy in the upper chamber of the commutator maintaining said piston in position 0.1, forming an auto-relief circuit.

10. (Currently amended) Circuit for an apparatus that carries out handling with suckers, The apparatus according to previous claims, characterized in that Claim 1, wherein the circuit with the auto-relief function is activated when the vacuum has reached a sufficient depression value to maintain the piston of the second pneumatic commutator in raised position.

11. (Currently amended) Apparatus for handling with suckers, according to previous claims, characterized in that there is Claim 1, further comprising a connection between the lower chamber of the shaft and the upper chamber of the piston.

12. (Currently amended) Circuit for an apparatus that carries out handling with suckers, The apparatus according to previous claims, characterized in that Claim 1, wherein, in the case that the sucker should suffer a substantial loss of adherence or detaches, the auto-relief of the second commutator of the second block is automatically de-excited, automatically interrupting the supply of the vacuum generator.

13. (Currently amended) ~~Circuit for an apparatus that carries out handling with suckers, The apparatus according to previous claims, characterized in that~~ Claim 1, wherein in the circuit, in the stand-by phase, the first pneumatic commutator of the second block equipped with a sturdier spring than the spring of the second commutator, by increasing depression allows the movement of the piston to the high position, subsequently with respect to the first commutator, placing it into the auto-relief position, in such a way as to interrupt the airflow originating from the first electro-valve of the first block, destined to supply the vacuum generator.

14. (Currently amended) ~~Circuit for an apparatus that carries out handling with suckers, The apparatus according to previous claims, characterized in that~~ Claim 1, wherein during the loss of depression phase, the piston of the first pneumatic commutator moves, placing itself in a low position, so that the airflow originating from the first electro-valve of the first block supplies the first pneumatic commutator in a high position which in turn, through the third pneumatic commutator, will supply the vacuum generator that re-opens the relief valve.

15. (Currently amended) ~~Circuit for an apparatus that carries out handling with suckers, The apparatus according to previous claims, characterized in that~~ Claim 1, wherein in the circuit, the depression re-activation phase makes provision for the circuit depression value to return to the maximum on the re-opening of the relief valve, in this way re-positioning by auto-relief the piston of the first pneumatic commutator to a high position and thus re-closing the compressed airflow originating from the first electro-valve of the first block with similar closure of the relief valve.

16. (Currently amended) ~~Circuit for an apparatus that carries out handling with suckers; The apparatus according to previous claims, characterized in that~~ Claim 1, wherein in the circuit, the detachment phase of the sucker from the material, takes place continuously to maintain the first electro-valve of the first block excited and exciting a third electro-valve, which makes a higher air pressure flow to the circuit than the pressure flowing to the second electro-valve, thus moving the sphere of the alternative valve; the air with a higher pressure than that exerted for the activation of the system for the adherence of the materials maintains the piston of the first pneumatic commutator in high position, moreover it moves the cursor of the third pneumatic commutator to a low position, in this way blocking the supply of the vacuum generator means, bypassing the airflow directly to the circuit to the sucker.

17. (Currently amended) Apparatus according to previous claims, characterized in that Claim 1, wherein the vacuum generator means of the type with Venturi effect are used.

18. (Currently amended) Circuit and apparatus that carries out handling with suckers, characterized in that wherein a vacuum pump is provided that supplies the circuit for the sucker detachment phase with a pressurized airflow, exciting the first electro-valve and de-exciting a fourth electro-valve, when for all the other previous phases the circuit is supplied by a line in depression rather than under pressure.